



Provision of Social Science advice to address priority needs of fishery management stakeholders

NEFSC Economics & Human Dimensions
Science Program Review
May 1-4, 2017

Not all FIMPs are created equal

NEPEC Groundfish:

- FMP developed in 2008
- 32 Plan Amendments
- Just wrapped up 5th Framework Adjustment
- Average of 2.5 actions per year*

MAFMC Surf Clam and Chowder Quabog

- FMP developed in 2017
- 32 Plan Amendments
- 3 Framework Adjustments
- Average of one action every two years*

ity the nature of the plans and their complexities, management advice responsibilities can not be distributed uniformly, creating heterogeneity in FTE time allocated to management advice provision.

It's an average year we:

- support active development teams, plan committees, and
- lead and coordinate impact sessions

development of 6-10 R O 2006 and 2010 analyses.

• we do Regional Economic, or EA Regulatory Impact Reviews

• take time to providing analysis and management advice

• take time to take time

¹The SSF conducts applied economic and sociocultural research on the use and management of commercial and noncommercial fisheries, protected species resources, and marine ecosystems. Through its work, the branch seeks to improve the net benefits derived by the nation from its regional endowment of renewable marine resources.²

SSB provides fishery management advice to stakeholders consistent with legislative and other requirements

- Stakeholders:
 - The general public
 - DACHS/ANMHA
 - GAFPO
 - NIA and NIE PACs
 - Professional and continental safety participants
 - Non-governmental organizations:
 - Fishing industry
 - Environmental and other citizen-based
 - Academics and students
- Legislative and other requirements:
 - SFCRA
 - MSHA
 - OSHA
 - NEPA
 - DEA
 - EPC 12808, 12806 and 12871

Socio-cultural and economic considerations are embedded in the fabric of the MJA

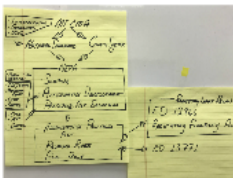
¹⁰Conservation and development measures chief prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry" (MSEA, NS 1).

"If it becomes necessary to allocate or weigh fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an exclusive share of such privileges." (MMA, 93, 4)

"Conservation and management measures that, where practicable, contain efficiency in the utilization of fishery resources" except that no such measure shall have adverse allocation or its sole purpose." (JWSA, vol. 3)

¹Conservation and management measures that, where practicable, *minimise adverse and avoid unnecessary depletion* (MMA, NS 7)

¹⁰ "Conservation and management measures shall... take into account the importance of fishery resources to fishing communities (by offering economic and social data...) in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, achieve adverse measures; *logically* in such communities." (MCA, 1976: 9)



TIMELINE FOR DEVELOPMENT OF AMENDMENT 18 TO THE
GROUND FISH PLAN

Spring 2013	-Scoping
Summer 2013	- <i>Let's connect for executive share analysis</i>
	-Develop TOCs for contract
Fall 2013-Spring 2014	-Develop analysis
Summer 2014	-Peer review of analysis
	-Present peer review results to Council
Fall 2014-Spring 2015	-Analysis to support A/E development
Spring 2015	-Select Final Alternatives
Summer 2015	-Analyze Alternatives
Fall 2015	-Select Preferred Alternatives
Spring 2016	-RFA and EO 12866 analysis
Summer-Fall 2016	-Develop proposed final rules
Spring 2017	-Publish final rule

Topics for discussion

[illegible]

Fishery management issues are a social scientist's bread and butter

- common property resource management
- market vs. command regulations
 - technology vs. performance standards
- BCA and the importance of costs
- value of goods traded in markets
- non-market valuation
- value and cost of obtaining information
- market failures
 - non-competitive markets
 - asymmetric information
 - externalities
- principal-agent problems

...and on and on.

...and on and on.

Our services are underprovided

The social scientist as planner

1996, 2007, 2012)

Emerging issues and challenges

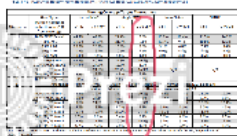
- New MRP data means technical and commercial allocations may be on the table for many FMPs simultaneously
- Five year reviews of LAPP programs required, newly published guidance include substantial analytical burdens
- Executive Order 13771 requires estimating costs and benefits of all regulatory actions, significant or not, including RISA and RAPA actions
- New NOAA policy on interpreting non-profit organizations that own quota, allocations or fishing businesses for the RFA takes us into novel territory

Regulatory Impact Review

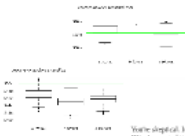
- Executive Order 12866
 - Target audience is DIRA and CBO
 - Benefit/Cost analysis
 - All affected sectors/other businesses
 - Medium-term time horizon (real dollars, discount rate)
 - Question: is this an economically significant rule?
 - significant annual effect (> 1 2014 dollars), or
 - significant economic impact on particular region or sector of the economy

- Regulatory Flexibility Act (RFA)
 - Target audience is Small Business Administration
 - Short-term change in financial status
 - Limited to regulated entities (few small businesses, not vessels)
 - Questions: will rule have a significant economic impact on a substantial number of small entities?
 - Small business size standard for 2016 = \$22m, applies to all fishing businesses

Other ad hoc analyses in support of management:



Qaza Change Model: economic impacts



Quota Change Model: distributional impacts

- Community level indices that quantitatively measure aspects of fishing community vulnerability and resilience:
 - Importance of commercial and recreational fishing
 - Social vulnerability
 - Destitution pressure vulnerability
 - Climate change vulnerability
- Applications:
 - Grandfish and menhaden SAs
 - State of the Ecosystem Reports for WA and the FSCs
 - Climate change vulnerability assessments
 - Human dimensions of US coast shore programs report (in press)

<http://www.crrb.usatq.com/medicines/medicinal-herbs/>

Tools and methods used in the provision of management advice

- **NO models**
 - o generalises employment and welfare impacts
- **Demand models**
 - o price changes with respect to quantity
 - o Most are full welfare (expenditure) models
 - o Impacts on non-market benefits
 - Impacts from regulations evaluated by CBA and WBAW
- **Overlap of modelling approaches to benefits**
 - o permits modelling non-market benefits in analysis
 - o Main to CBA and constrained applications
 - Impacts of price changes in such share fisheries
 - o Decision criteria modelling
 - changes in social distribution of fishing
 - o Production models
 - reg. impact changes
 - estimated impacts across dimensions (prices, profits, cost, species)
- **MRV**
 - o studies and benefits from different fisheries
 - o Industrial organisation and impacts of industry concentration
 - o extensive studies on decision

We are unique within the Agency in that we combine both Research and Management Advice social science functions under one roof

All other Regions have separate social sciences staffs at Centers and IFDs.

Year	Country	GDP (USD)	Population (millions)	GDP per capita (USD)	Life expectancy (years)
1990	USA	26,668,000,000,000	250	106,672	75.4
2000	USA	106,672,000,000,000	280	381,000	77.1
2010	USA	149,947,000,000,000	310	483,699	78.5
1990	China	16,553,000,000,000	1,190	13,909	71.4
2000	China	109,947,000,000,000	1,250	87,957	71.4
2010	China	59,947,000,000,000	1,370	43,757	74.7
1990	India	16,553,000,000,000	850	19,474	62.5
2000	India	109,947,000,000,000	1,020	107,840	64.5
2010	India	59,947,000,000,000	1,100	54,497	68.5

This is good, and bad

This is good, and how

Currently we staff 12 of 18 active DDTs and DMTs

[illegible]

Science, service, stewardship



Topics for discussion

with integrated management/regulatory (SFI) and
events: what are the benefits? Costs?
performs clearances on behalf of Regional
CL, not Science and Research Director (NEC)...is
independent?
subject to analysis are not well established and
general terms
y shifts entire analytical sections for documents,
line sections and letters for some fisheries (e.g.
shrimp (e.g. everything else).
shrimp issues on SSC, and sometimes generates
identify despite having no professional economists
it provided to ASHRC.
1 hour FIC's since last program review, three in
leaves significant deficits...will we be able to
enrichment?
high-quality advice to GARFO, the MA and NE
go? Where could we do better? Strategies for

ment issues are a social scientist's bread and butter

resource management
and regulations
performance standards
portion of costs
used in markets
data
obtaining information
no markets
formation
systems

Our services are underprovided

The social scientist as plumber

who cares about the details of policy implementation
tension to many details and complications, some of
to be far below their pay grade or far beyond their
it will sometimes appear that the extensive training
deserved if, the theoretical complexities turn out to
On the other hand, they will have a chance to apply
rural, since many of the details have implications
is an economist's bread and butter: incentives,
perfect rationality, etc."

B. Duffin, *NY Times*, 2007/05/1

Emerging issues and challenges

data means recreational and commercial
may be on the table for many FMPs
ly
Areas of LAMP programs required, nearly
evidence include substantial analytical burdens
der 13771 requires assessing costs and
regulatory actions, significant or not,
A and MMPA actions
policy on interpreting non-profit organizations
its, allocations to fishing businesses for the
is, with novel certainty

Regulatory Impact Review

SE
ce is OIRA and CBO
analysis
characterizing businesses
time horizon (real dollars, discount rate)
is an economically significant rule?
social effects? (i) (ii) (iii) (iv) (v) (vi) (vii) (viii) (ix) (x) (xi) (xii) (xiii) (xiv) (xv) (xvi) (xvii) (xviii) (xix) (xx) (xxi) (xxii) (xxiii) (xxiv) (xxv) (xxvi) (xxvii) (xxviii) (xxix) (xxx)
economic, financial, or other impact on a
market or sector of the economy
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Provision of Social Science advice to address priority needs of fishery management stakeholders

NEFSC Economics & Human Dimensions Science Program Review May 1-4, 2017

"The SSC conducts applied economic
research on the use and management
recreational fisheries, protected
marine ecosystems. Through its
analysis the net benefits derived
regional endorsement of renewable

SSB provides fishery management advice

Stakeholders:

- The general public
- COC/NMFS
- GARFO
- MA and NE FMC's
- Recreational and commercial fishery participants
- Non-governmental organizations
- Fishing industry
- Environmental and other citizens
- Academics and industry

Legislation and other requirements:

- MSA
- MFA
- ESA
- NEPA
- MSA
- FGA 13886, 13888 and 13771

Socio-cultural and economic

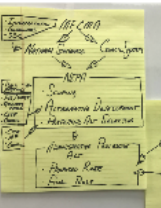
"Conservation and management measures that pose
economic losses, the authors said, form much of the
industry." (JGSA, NS 12)

"It becomes necessary to allocate or assign fishing
rights among United States fisheries, such allocation shall
fisheries, all knowledge obtained to a certain extent
owner but no particular individual, cooperative, or
exclusive share of such privileges." (JGSA, NS 4)

"Conservation and management measures shall relate
to the utilization of fishery resources, control but not
allocation as its sole purpose." (JGSA, NS 5)

"Conservation and management measures shall relate
and necessary allocation." (JGSA, NS 7)

"Conservation and management measures shall... take
fishery resources to fishing communities, and... shall
order to be made for the maximum participation of
entire practical, without adverse economic impact
NS 1)



TIMELINE FOR DEVELOPMENT OF GROUND FISH F

Spring 2013	-Scoping
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Fall 2014-Spring 2015	-Peer review
Spring 2015	-Present peer
Summer 2015	-Analysis to s
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Spring 2016	-Analysis Alter
Summer fall 2016	-Select final
Spring 2017	-RFA and EO
	-Develop prap
	-Publish final

NEFSC Groundfish:
- FMP developed in 1966
- 10 Plan Amendments
- Just wrapped up 5th Framework Adjustment
Average of 2.6 actions per year

MAFMC: Gulf of Mexico and Eastern Quilling
- FMP developed in 1977
- 16 Plan Amendments
- 1 Framework Adjustment
Average of one action every two years

By the nature
complexities
responsibilities
uniformity, on
time allocation
provision

"The SSB conducts applied economic and sociocultural research on the use and management of commercial and recreational fisheries, protected species resources, and marine ecosystems. Through its work, the Branch seeks to increase the net benefits derived by the nation from its regional endowment of renewable marine resources."

SSB provides fishery management advice to stakeholders consistent with legislative and other requirements

Stakeholders:

- The general public
- DOC/NOAA/NMFS
- GARFO
- MA and NE FMC's
- Recreational and commercial fishery participants
- Non-governmental organizations
 - Fishing industry-based
 - Environmental and other citizen-based
- Academics and students

Legislative and other requirements:

- MFCMA
- MMPA
- ESA
- NEPA
- RFA
- EO's 12866, 12898 and 13771

Socio-cultural and economic considerations are embedded in the fabric of the MSA

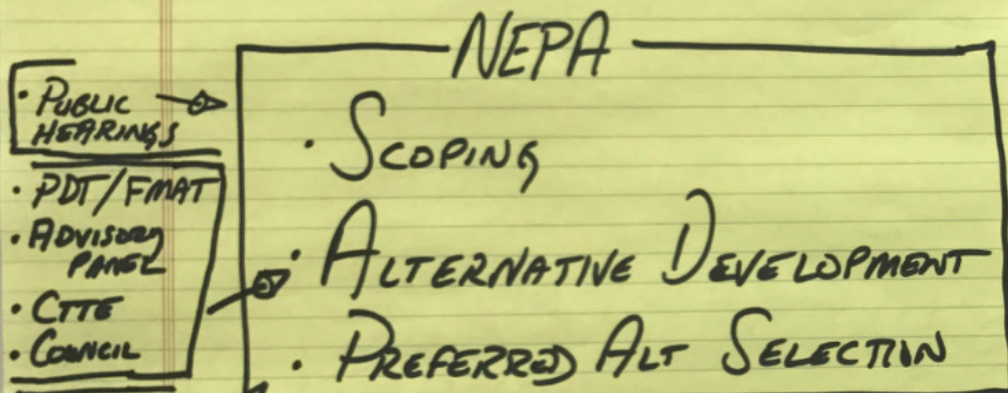
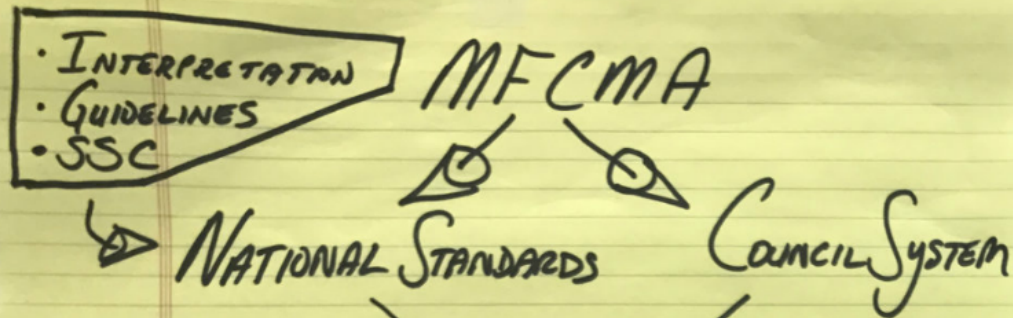
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"Conservation and management measures shall, where practicable, **consider efficiency in the utilization of fishery resources**; except that no such measure shall have economic allocation as its sole purpose." [MSA, NS 5]

"Conservation and management measures shall, where practicable, **minimize costs** and avoid unnecessary duplication." [MSA, NS 7]

"Conservation and management measures shall...**take into account the importance of fishery resources to fishing communities** by utilizing economic and social data ...in order to (A) provide for the **sustained participation** of such communities, and (B) to the extent practicable, **minimize adverse economic impacts** on such communities." [MSA, NS 8]



• PUBLIC HEARINGS

• PDT/FMAT

• ADVISORY PANEL

• CTE

• COUNCIL

• CTE

• AP

• COUNCIL

ADMINISTRATIVE PROCEDURE ACT

• PROPOSED RULE

• FINAL RULE

REGULATORY IMPACT REVIEW

ED 12866

REGULATORY FLEXIBILITY ACT

ED 13771

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Not all FMPs are created equal

NEFMC Groundfish:

- FMP developed in 1986
- 18 Plan Amendments
- Just wrapped up 56th Framework Adjustment

Average of 2.6 actions per year

MAFMC Surf Clam and Ocean Quahog:

- FMP developed in 1977
- 18 Plan Amendments
- 1 Framework Adjustment

Average of one action every two years

By the nature of the plans and their complexities, management advice responsibilities can not be distributed uniformly, creating heterogeneity in FTE time allocated to management advice provision

Currently we staff 14 of 19 active PDTs and FMATs


FMP	Action Plan Type	Council	SSB FTE
Summer flounder, black sea bass, scup	FMAT	MAFMC	Scott Steinback, Chad Demarest
Squid, mackerel, butterfish	FMAT	MAFMC	John Walden
Bluefish	FMAT	MAFMC	
Tilefish	FMAT	MAFMC	Barbara Rountree
Surf clam/ocean quahog	FMAT	MAFMC	John Walden
Dogfish	FMAT	Joint MA/NEFMC	Scott Steinback
Habitat	FMAT	MAFMC	
Ecosystems	FMAT	MAFMC	Geret DePiper
Northeast multispecies	PDT	NEFMC	Chad Demarest
Atlantic sea scallop	PDT	Joint MA/NEFMC	
Monkfish	PDT	Joint MA/NEFMC	Trish Clay, Tammy Murphy
Habitat	PDT	NEFMC	Geret DePiper
Whiting	PDT	NEFMC	
Atlantic herring	PDT	NEFMC	Min-Yang Lee
Vessel baseline	Other	GARFO	Barbara Rountree
Skates	PDT	NEFMC	
Red crab	PDT	NEFMC	Barbara Rountree
Lobster	Other	GARFO	Barbara Rountree
Ecosystems	PDT	NEFMC	Geret DePiper

In an average year we:


- participate in 20+ management action development team, plan committee, and/or advisory panel meetings
- produce 8-10 NEPA social and economic impact analyses
- produce or assist in the development of 8-10 E.O 12866 and RFA analyses
- issue clearance letters, via the Regional Economist, for 14 Regulatory Impact Reviews
- allocate 4,992 hours of FTE labor time to providing analysis and management advice, over one quarter of our total FTE labor time budget

We are unique within the Agency in that we combine both Research and Management Advice social science functions under one roof

All other Regions have separate social sciences staffs at Centers and RO's



FMC	Councils Supported	Economics	Human Dimension	Total FTEs	FTE hours, management	FTE hours, science
Greater Atlantic Regional Office	NEFMC, MAFMC	0	0	0		
Northeast Fisheries Science Center	NEFMC, MAFMC	8	3	11	4,992	14,310
Southeast Regional Office	GMFMC, SEFMC, CFMC	5	2	7	10,920	2,912
Southeast Fishery Science Center	GMFMC, SEFMC, CFMC	6	2	8		13,312
West Coast Regional Office	PFMC	5	1	6	9,360	2,496
Southwest Science Center	PFMC	6	0	6		9,984
Northwest Science Center	PFMC	7	1	8		13,312
Alaska Regional Office	AFMC	3	0	3	4,680	1,248
Alaska Fisheries Science Center	AFMC	6	0	6		9,984
Pacific Islands Regional Office	WPFMC	1	0	1	1,560	416
Pacific Islands Science Center	WPFMC	2	1	3		4,992



Region	# supported FMPs	Regional FTE, total	Regional Management FTE Equivalent	#Supported FMPs per FTE
GARFO	15	11	2.4	6.3
SERO	17	15	5.3	3.2
WCRO	4	20	4.5	0.9
ARO	5	9	2.3	2.2
PISC	5	4	0.8	6.7

This is good, and bad



Tools and models used in the provision of management advice

- I/O models
 - second-order employment and welfare impacts
- Demand models
 - price changes with respect to quantity
- Non-market valuation techniques
 - impacts on recreational fisheries
 - impacts from regulations mandated by ESA and MMPA
- Combined qualitative/quantitative techniques
 - community resilience, social impacts analysis
- Monte Carlo and constrained optimization
 - impacts of quota changes in catch share fisheries
- Decision choice modeling
 - changes in spatial distribution of fishing
- Producer welfare
 - aggregate changes
 - differential impacts across dimensions (vessel sizes, ports, gear types)
- NPV
 - costs and benefits vary over time
- Industrial organization and models of industry concentration
 - excessive shares determination

Community Social Vulnerability Indicators (CSVIs) and Mapping Tool Website

Community level indices that quantitatively measure aspects of fishing community vulnerability and resilience:

- Importance of commercial and recreational fishing
- Social vulnerability
- Gentrification pressure vulnerability
- Climate change vulnerability

Applications

- Groundfish and monkfish SIAs
- State of the Ecosystem reports for MA and NE FMCs
- Climate change vulnerability assessments
- Human dimensions of US catch share programs report (in press)

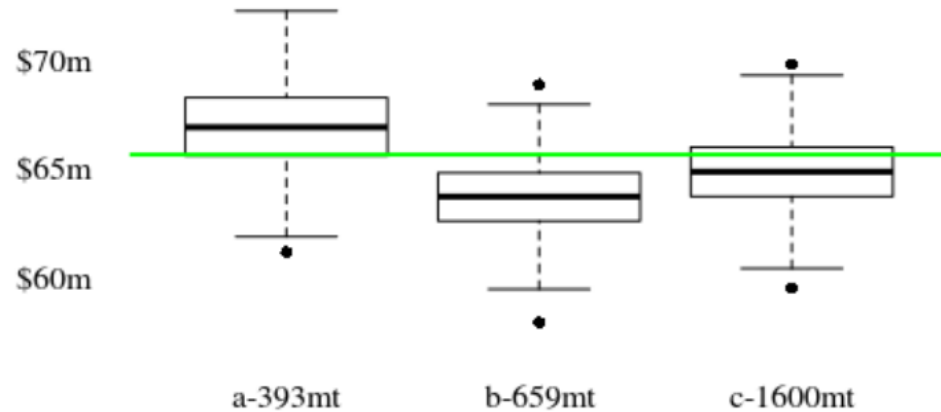
<http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/map>

Quota Change Model: distributional impacts

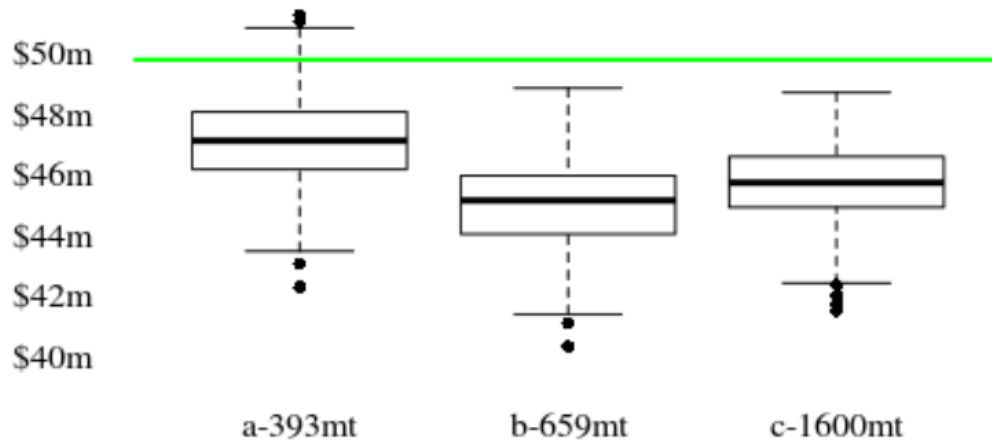
	FY14 Baseline			FW 53 <u>ACLs</u>			FW 53 <u>ACLs</u> + Closure A			FW 53 <u>ACLs</u> + Closure B			FW 53 <u>ACLs</u> + Zero Retention GOM cod			FW 53 <u>ACLs</u> + ZR GOM cod + Closure A			FW 53 <u>ACLs</u> + ZR GOM cod + Closure B		
	Rev	p5 rev	p95 rev	Rev	p5 rev	p95 rev	Rev	p5 rev	p95 rev	Rev	p5 rev	p95 rev	Rev	p5 rev	p95 rev	Rev	p5 rev	p95 rev	Rev	p5 rev	p95 rev
Connecticut	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Massachusetts	43.8	39.7	48.2	40	35	45.3	41.2	36.5	46.1	41	36.1	45.9	39.6	34.8	44.6	40.6	36	45.4	40.7	36	45.5
<i>Boston</i>	12.9	11.8	14.1	12.1	10.4	13.8	12.9	11.3	14.7	12.8	11	14.7	12	10.3	13.7	12.8	11.1	14.6	12.8	11.2	14.5
<i>Gloucester</i>	10.3	9.4	11.4	7.5	6.5	8.4	8.2	7.2	9.3	8.1	7.1	9.1	7.3	6.4	8.3	7.9	6.9	8.8	7.9	6.8	8.9
<i>New Bedford</i>	15.4	14	16.8	16.4	14.9	18.1	16.9	15.5	18.2	16.8	15.4	18.1	16.3	14.9	17.8	16.8	15.5	18.2	16.8	15.4	18.2
Maine	14.8	13.2	16.4	12.4	10.7	14.1	12.9	11	14.7	12.4	10.9	14.2	12	10.4	13.7	12.6	11	14.5	12.4	10.7	14.2
<i>Portland</i>	12.3	11	13.7	10.7	9.1	12.1	11.4	9.8	13	11.1	9.7	12.6	10.4	9	11.9	11.3	9.8	12.9	11.1	9.7	12.7
New Hampshire	2.4	2.1	2.7	1.4	1.2	1.6	1.3	1.1	1.5	1.3	1.1	1.5	1.3	1.1	1.5	1.2	1	1.4	1.2	1	1.4
New Jersey	0.3	0.2	0.3	0.2	0.1	0.3	0.2	0.1	0.3	0.2	0.2	0.3	0.2	0.1	0.3	0.2	0.2	0.3	0.2	0.1	0.3
New York	0.9	0.7	1.2	1.2	0.9	1.6	1	0.7	1.3	1	0.7	1.3	1.2	0.9	1.6	1	0.7	1.2	1	0.7	1.3
Rhode Island	2.1	1.8	2.5	2.7	2.3	3.2	2.6	2.1	3	2.6	2.1	3.1	2.7	2.3	3.2	2.5	2.1	3	2.5	2.1	3
<i>Point Judith</i>	1.6	1.4	1.8	2.1	1.8	2.4	1.9	1.7	2.2	1.9	1.7	2.2	2.1	1.8	2.3	1.9	1.7	2.2	1.9	1.7	2.2
Other Northeast	0.1	0	0.1	0	0	0	.	.	.	0	0	0	0	0	0	0	0	0	0	0	0

Quota Change Model: aggregate impacts

Gross revenues on groundfish trips



Gross revenues from groundfish



You're skeptical. It's OK. I expected it.

Executive Order 12866

- Target audience is OIRA and CBO
- Benefit/Cost analysis
- All affected sectors/fishing businesses
- Medium-term time horizon (real dollars, discount rate)
- **Question: is this an economically significant rule?**
 - *>\$100mil annual affect (+/-, 2016 dollars), or*
 - *significant economic impact on particular region or sector of the economy*

Regulatory Flexibility Act (RFA)

- Target audience is Small Business Administration
- Short term change in financial status
- Limited to regulated entities (owners/businesses, not vessels)
- **Question: will rule have a significant economic impact on a substantial number of small entities?**
 - *Small business size standard for 2016 = <\$11mil, applies to all fishing businesses*

Emerging issues and challenges

- [New MRIP data](#) means recreational and commercial allocations may be on the table for many FMPs simultaneously
- [Five year reviews of LAPP](#) programs required, newly published guidance include substantial analytical burdens
- [Executive Order 13771](#) requires assessing costs and benefits of all regulatory actions, significant or not, including ESA and MMPA actions
- New NOAA policy on [interpreting non-profit organizations](#) that own quota, allocations or fishing businesses for the RFA takes us into novel territory

The social scientist as plumber

*"...an economist who cares about the details of policy implementation will need to pay attention to many details and complications, some of which may appear to be far below their pay grade or far beyond their competence level. It will sometimes appear that the extensive training they received is underused if...the theoretical complexities turn out to be second order. On the other hand, they will have a chance to apply their economist's mind, since **many of the details have implications for issues that are an economist's bread and butter: incentives, information, imperfect rationality, etc.**"*

E. Duflo, Ely Lecture, 2017 AEA

Fishery management issues are a social scientist's bread and butter

- common property resource management
- market vs. command regulations
 - technology vs. performance standards
- B/CA and the importance of costs
- value of goods traded in markets
- non-market valuation
- value and cost of obtaining information
- market failures
 - non-competitive markets
 - asymmetric information
 - externalities
- principal-agent problems

...and on and on.

Our services are underprovided

Topics for discussion

- NE is the only Region with integrated management/regulatory (SF) and science (ST) requirements...what are the benefits? Costs?
- Regional Economist performs clearances on behalf of Regional Administrator (GARFO), not Science and Research Director (NEC)...is this relationship acceptable/sustainable?
- Property rights with respect to analyses are not well established and variable across management units:
 - MAFMC frequently drafts entire analytical sections for documents, including RIRs;
 - NEFMC drafts entire sections and RIRs for some fisheries (e.g. scallops) but not others (e.g. everything else);
 - GARFO staff sometimes leans on SSB, and sometimes generates analyses independently despite having no professional economists on staff;
 - Virtually no support provided to ASMFC.
- Staffing: SSB has lost four FTE's since last program review, three in the last year, and this leaves significant deficits...will we be able to meet current and future mandates?
- Does SSB provide high-quality advice to GARFO, the MA and NE FMC's? Are there gaps? Where could we do better? Strategies for improved integration?

